

# DRAGON



# USER

*The independent Dragon magazine*

June 1988

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## Editorial

TRADITIONALLY the editor is the last to know when changes occur in the publishing office. Then the editor carries the news to the readers. We presented you the big news, and the big news is... That Dragon User is leaving Substima Publications, and taking wing westward to a new nest at the premises of the newly hatched Dragon Publications.

Dragon Publications' guardian and sponsor, however, wasn't notified yesterday and is further known to the Dragon World as Bob Harris of Harris Ware Software.

Dragon User is pleased, proud and grateful to him for subsidizing the loss of subsidizing the magazine as its corner by the chimney stack of Little Newport Street, and for his gifts with parcels of the knowledge and knowledge pervasion was becoming increasingly undeniable. It's a while computing activities have left for other subscribers at the Club Services. Substima Publications' latest efforts for long time — now it's back in the computing community.

I ask all Dragon Users to join me in wishing Bob the very best in his role as owner and guardian angel at DU. He has pledged that DU will remain an independent publication serving the whole DRUG community as it has always been.

And he does the paperwork. Greater love hath no Dragon user.

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### How to submit articles

The quality of the material we can publish in Dragon over each month will to a very great extent depend on the quality of the submissions that you can send with your Dragon. The Dragon computer was founded on the central editor powerful version of Basic, but with very poor documentation.

Articles which are submitted to Dragon User for publication should not be more than 3000 words long. All submissions should be typed. Please leave wide margins and a double space between each line. Programs should, wherever possible, be complete (print or data) whole paper and be accompanied by a tape of the program.

We cannot guarantee to return every submitted article or program, so please keep a copy if you wish to retain your program material. Please include a stamped-addressed envelope.



## READ-PC and footnotes

I WILL be happy to provide working diskette versions of all the software listed in READ-PC (Dragon User March 1986) to those readers who send me an empty formatted diskette (two if they want CG-2 stuff) and a self-addressed pre-paid envelope (ten for double 40-track single and double 256k and for each single and double sided 320k disc in both DragonSDS and DragonCG-2) and if you have some stored up old trade software — send it along!

In the listing at line 340 some Finnish characters slipped through. The character A without data over it is equal here to a left square bracket obtained by pressing Shift and Down arrow at the same time on the Dragon keyboard. The new accent leaning to the right is equivalent to the  $\alpha$  sign ( $\alpha$ ) on the keyboard.

The reference in the text to brackets means square brackets, which on Finnish printers produce two local variations (A (Ascii) and Å). The letters are easy to mistype. Ascii codes 123 and 126. They cannot be obtained from the keyboard but when made using CG-2s look like reversed video square brackets on the screen.

The Dragon's cassette IO system has been made to use characters which cannot be produced by the keyboard (can not be loaded from cassette at all) (I don't know why). This includes letters. The problems with Ascii letters have many reasons. I never tried it myself. I only tested as editor (read ability to read Ascii) of how much possibly is not built as perfect as claimed. I suggest readers write their own Micro-soft Basic editor based on LINE INPUT (F1) Adj (or F1 Adj) which will certainly work.

In the present one I made some useful changes to FRACPC. They suppress the disc drive based readers if the sector read is on the same track as the previous one which saves considerable time and wear on the drive.

1 Delete lines 340 — 360

2 Add the following lines

```
37 OF = 1
38 IF = 195 - OF 14404 430
40 OF = TRM
```

```

1 BRADD & SPECTOR OF A 3175
2 (POSITION INDEPENDENT CODE)
3
4 GIVE PCB 360
5 GIVE PCB 321
6 SPECTOR PCB D,X,Y,C,F
7
8 HASE IRQ, FIRQ:
9 ORC 0
10
11 SET OF HASE SPECTOR
12 LD 5010A
13 JNZ OLDRMI,PCB
14 LEAX MHIVEC,PCB
15 STX 5010A
16
17
18 LDA 00FF
19 TFR 4,DP
20
21 LOAD TIMEOUT COUNTER:
22 LOY 00FFFF
23 LEAX 0FFFF,PCB
24
25
26
27 LDA 4800 ;PIA 18 CTRL
28 ORA 4801 ;ENABLE FLAG
29 STA 4800 ;00 ON TP
30 LDA 4802 ;CLEAR UP SRC
31 LDH 7107,PCB ;read CHS
32 STB 4840 ; START
33
34 FRACPC TMI:
35 LDA 0015,PCB
36 STB 4840
37
38
39 RELOOP LDA 4800
40 ORL 0015
41 DEBT -1,2
42 BNE RELOOP
43 BNE EXIT
44
45
46 RTLP 100 4323
47 RPL RTLP
48
49 SKIP 100 4840 ;DATA RPL
50 LD 4802 ;EMITTAGE
51 STB 0 ;INTC 00FFFF
52 RPL RTLP
53
54
55 RMI 100 19,8
56 RTT 100 4802 ;EMITTAGE
57
58 STOP RTOR & DISABLE SRC:
59
60 CLR 4840
61 JNZ 0FFFF,PCB
62 LD OLDRMI,PCB
63 STX 4810A,PCB
64 PULS D,X,Y,C,F,DP
65 RTD
66
67
68 ORC 1 0096
69 OLDRMI RPL 2
70 0FFFF RPL 2
71 00FF RPL 7074

```

In addition the new disk on reading 320k diskette can launch an interrupt in addition to the changes mentioned for this purpose the following change should be made also in line 60 change the value of 17 from 19 to 14

Finally to be aware that the program will not work on a

single sided (original Dragon Cart) disc drive. I strongly recommend purchase of a double sided drive which are cheap nowadays as PC owners are changing to hard disk. If 525k I should be capable of working on a max disk 40 track drive.

I include a DREAM source

listing of the sector read routine for those interested.

Markku Vainanen  
Puhelinnumero 00 14  
50-00320  
Helsinki  
Finland

## Cursors old...

In the March 1986 issue Paul Reed was asking about a routine for altering the shape of the cursor.

I think this routine for editing thinking of was published in the letters page of the August 1986 issue under the heading New Shape Your Great Series of Mouse Options.

Jack Lund  
47 Ingers Rd  
Boston  
MA 02108

## ... and new, with extras

I apologise for a lot of 1986 information and the January edition. To turn the cursor off you actually need to POKE 40000000 and to turn it back on POKE 40000000 & POKE 40000000. May I be also somewhat by giving a program that works in conjunction with Mouse Assistant, breaking the 64 in the February edition and gives a green on black display with a repeat initial case POKE 40000000 & POKE 40000000 to turn it off the cursor and POKE 40000000 & POKE 40000000 to turn it back on.

```

100 EXEC 40000
101 POKE 40000 18
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# Dragonsoft

## Just the right game for old addicts

Title: *Superious*  
Supplier: *Orange Software*  
The Game: *Star Road* *Hardy*  
Corny: *Afterglow*  
Price: £2.99

LET me take you back in time. Wey back to around 3 BC (Before Dragons) but in those long gone days the primitive British public were addicted to a simple game called *Space Invaders*. However they began to get bored and cried out for more and in return new hybrids appeared, of which one had rather sharp graphics and was called *Asteroids*. For many years later *Orange Software* have taken that aged idea and transformed it into the game *Superious*.

Yes, this is right, *asteroids* but before you say "why have they gone another version of that I got a couple of it free when I bought the computer and that was no good" let me state *Orange Software* have not just thrown out and had the closest of the old game

will explode into fast dodging your problems. This happens five times a day (or even once) not only before you finally destroy it although the screen goes crowded and harder but it is not 100% sure despite for dozens of times I've played it.

Things are never so simple though, if you collect into one of the passing stars you lose some of your vital energy. Also the money you make in the number you can lay but both money and energy are replaced slowly by way of a laser leading style docking procedure which you link up to the under side of the *Space Queen Probe*. Putting which sounds easy but results in losing all your energy and possibly just if the probe can't return to land.

After reflecting you have full energy and money and adjust but you do have spent credits in case you previously ran out of energy or blew yourself to bits and fortunately you live in a very small, old galaxy because if you leave the screen

A medal is certainly what *Orange Software* is a name new to the deserve for breathing new life into such an old and dated idea. I'm not saying this is an all-time classic by far every staff has faults about with the game, for one after initial addictions it is mediocre placed into a credible level of aptitude and you can cleanup whole screen. There is no new challenge.

No sport item's slight shortage of variety and or creativity this is a tale with which I gave a few hours without really enjoying your blood pressure getting you to the edge of your seat unless you are an ardent fan of the old arcade game (*the cat's*) — Ed.

Philip Cook



## Would you trust a hero lost in the woods?

Title: *Forest of Doom*  
Supplier: *Orange Software*  
Price: £2.99

*FOREST of Doom* is a program that has been conceived by *Orange Software* for the Dragon. Unfortunately this is not a conversion of a top selling game on the Amstrad or Commodore but from the *Oric*, a machine which disappointed long-term Dragon aficionados started, and what is more the *Oric* version was written in 1983.

An *Oric* fan, indeed we from half a decade ago may not sound immediately excited but bearing in mind that all initial enthusiasm with age think the *Amstrad* version of this (orange packaging) appears like I suppose and loaded to white (becoming familiar with the story).

A pinch went out to record four stories in the form of a story line resulting in your mind Arthur going out to rescue him, only to find it hard. Guess what you have to do? Recover the lost treasure, the *Prince* and *Arthur* finally these people were more careful in the first place.

You are also given a line sheet (in both the story and screen) instructions but these tend to spoil the game rather than improve it. For instance when you avoid the girls like chocolate and you find a chocolate machine it is a clue for anyone with a sliver of wit to do.

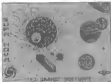
A lot of appropriate verbs is deployed, this allowed to say "helped". Apart from directions they are limited basically to get, drop, examine, look, in, victory, rub and tell, hardly an alternative to the Oxford English Dictionary.

The game is played on the standard green, but screen with a top-down description and accessible walls. Starting from home you can wander off through forests, getting chests and treasures, eventually and I can later into darker worlds of darkness and gloomy tunnels. Various characters are scattered around all of whom need something from you such as the messenger, the peasant, the hero, and even that and then who seem to be involved in your old job.

As the last I say that and then are in the game suggests there is a touch of welcome because in it there is a golden ally, indeed which he has been able to do into the adventure (if you change me) but certainly it is certainly a little thing about him (maybe not).

The adventure is well planned and logical without being overbearing to the old grey matter. One good which sets the mind at least though and finally you find a way to the other side of the rock, but only. Due to the lack of verbs all you really have to do is get the required objects and drop it. If you want to grow something you will grow some, you will drop it. If you do a rock you do just that, not drop it. (Speak for yourself, please). Although I realize this makes all difference in the outcome of the game it does diminish the atmosphere.

Small positive for the vocabulary and the puzzle after each required object is the limitation of the basic program (see *Basic* advertisement, coming back). This is the second I am convinced in a matter of weeks, direct from the potentially good if slightly flawed story line. I wanted more to this.



but have reflected its heart and built a more advanced program around it.

After an effective loading screen of several planets and stars the visual action is presented to reveal your sphere of space ship and a handful of stars showing around the screen. All you have to do is get rid of them by using bombs (from *Protonic Mines* to be exact) being careful not to blow over the mine yourself and blowing yourself up. One of the advantages starts more over a stationary mine than a

ray in the top, you immediately disappear at the bottom.

That a mixture of the game graphics are reasonable and have lost colour of colour but music is really only a list of a dropping tap sounds. Things get progressively more crowded until there's hardly room to breathe, let alone fly. Lay a proton presently, inevitably double pellet attempts you run out of lives although you will no doubt be awarded points automatically with a battery medal of the high score.

game as I went on, but the store built kept me from having up further. Not through to summer again though, and won't keep you at the keyboard too many nights, and a certainly better

than most of the day and night I could be with. In 1983  
Philip Stoll



## New fonts for old

**Program:** ComputerText and Script  
**Supplier:** Dragonfire/Services  
10 Perry Jones Circle, Blinn County, TX 77854  
**Price:** \$2.00 each cassette

One of the best features of MacDraw/Consultant's Printer Control wordprocessor is the ability to load alternate character sets (fonts). ComputerText and Script are the first two of a set of new fonts supplied on tape from Dragonfire/Services.

I received Printer Control in the August '85 edition (and the distributor told me June '85 edition) but for some reason was not free product here in a brief overview.

Printer Control is a powerful wordprocessing package supplied on a 5 1/4-inch floppy disk. The type version will take advantage of the 64-K byte memory and allow you to use the 198500 port (printing). Using 440 columns (24 lines on screen) and is entered and edited using the usual sort of cursor-controlled screen editing commands (such as insert, delete, find and replace, as well as block move, copy and delete).

Printer Control is not a Whirlwind (What You See Is What You Get) wordprocessor — although using the text centering, underlining, double width, etc. features when printing and moving up and down characters on the screen.

The major advantage of Printer Control is its ability to control and take advantage of the graphics capabilities of your printer. Each copy of Printer Control is customized for your type of printer (so also, which how you have when ordering almost every bit of graphics data matrix or dot is supported). It is a few other day when typing over 100 characters a line. Text can be printed in 4 lines with dots, underlining, proportioning, spacing, you name it.

In addition to all this, Printer Control is also a Pseudo 4

graphics editor. Pictures can be loaded a single point at a time in at four directions. And can be added, and blocks of text points can be rotated through 90 degrees.

The disk contains supports all the features of the original tape version (April) from the disk 32K to the Dragonfire, but also allows the keyboard input speed to be changed (a very useful feature). Most of the useful DDB (display) can also be changed with the program (because full disk size). Cassette loading and saving is also supported.

Using the graphics mode of the printer manual, but also using the light (bright) to make set can be loaded and editing using again it found in Printer Control (when using). Dragonfire/Services has taken advantage of this product and offers on tape. The first two are ComputerText and Script (an example of text is shown below).

The ComputerText font looks like the calculator numbers used on the bottom line of cheque books — it is the standard monospaced style font. The second font, Script, is a more sophisticated. It gives you a hand written look with good lowercase letters (if you can't see it, let me know). But you can't have everything. The character matches have been very carefully designed so that no matter what you type, the characters are not too different (they always, though).

The output quality will depend on a large extent on your printer, but with a good Epson (the Script style can be very impressive indeed). These fonts can be printed in any of the four available sizes and can be printed in with the standard Printer Control font. However, you can't have more than one set on the loaded at a time.

At the very reasonable price of \$2 a copy (based on a standard Printer Control user) — just think of the money can be saved by using it.

you can use these fonts with.

The Printer Control wordprocessor program is published by MacDraw/Consultant's 6 Appleton Drive, Caythorpe, N. Queensland, Lines 4032700. It is available from Home Movie Software, 48 Alexandra Road, Hornsby, NSW 1585. TWS 4032700. Price starts at £20 (for the disk version) but depends on your particular type of printer.

Shen Gedge



## Many squares make an education

**Program:** Mathmaster  
**Supplier:** George Software  
**Price:** \$2.00 cassette

WHEN Helen posted this piece of software for review I saw the author's accompanying letter. I felt that thought it was basically an educational program. Some people might not agree with the view but I certainly do. As well as being a memory game it encourages the younger members of the George community to get more familiar.

with the keyboard.

As I was asked for a quick turn round on this review I have not yet had the chance to convert it to disc, and had to put up with the slowness of cassette loading, although I was most pleased to find that there were absolutely no loading problems whatever, even if I had loaded it on many occasions. When loaded you are asked whether you would like to see the instructions or not. These are well set out and easy to understand.

You will see four different faces of Easy and Superhard. The former has five items which each appear six times and the latter has seven items each appearing twice only.

The top of the screen is lettered A-F and the side is numbered 1-6 and there are thirty areas of varying content. At the same time if there is a horizontal and vertical line through the lines of squares, alternate rows going in opposite directions, which gives a cross-touch to the game but unfortunately causes problems to the game itself.

The items are obviously listed in the same squares at the beginning of each game and I hope that Dragonfire/Services when it is eventually had to select the number of lines the squares move. This means that the same objects

See pages 10 and 11-4



# Update the Dragon

Roger Merrick says, don't embrace the Dragon — boost it.

WHEN you're not hot for the original (price of a Dragon 32 and a disk system) you could have a 12K Atari/Amiga PC or a 1M Atari 50 with 160K upgradeable multi-color video graphics. You can understand why people buy Ray Cooke's talk of hanging up their Dragons and moving on to computers now.

However, what I want to do here is make the case for persevering with the old beast (through re-wiring and upgrading the standard hardware). This need not involve getting caught in software religion — extensive re-thinking of your system can dramatically extend the utility of your system. By taking it to meet your specific requirements. Upgrading to a completely different system has additional costs above and beyond the price of the computer — you will have to write off your present investment in software, and build up a new tool set and environment (much higher priced). The main value of Dragon hardware and software is how completed is the purchase price. There is no guaranteed simple exit path as disk drives, monitors, or printers will be useful with your new system. The cost of these items can be overlooked when looking over the latest tomorrow's all singing all dancing main computers available to you. Then you realize, consider why you feel you need a new machine: is it because your present computer can't do something you feel you want to do? Or is simply that the Dragon has gained so much more people build when you speak excitedly of it and what it can do? Maybe you can stay a bit.

## RAM enlargement

For a Dragon 32 to be upgraded to 64K is nowadays fairly cheap. It is also relatively straightforward. Although I don't think DR has ever published details, NDIS can do it. A booklet which is very clear if you don't realize that this modification is your machine getting on with it. I paid just \$45, perhaps an increasing price as demand for 64K is now too small. Naïve people will do this upgrade for you, it is worth considering however whether it would be more cost-effective to purchase a second-hand 64K and get the HES222 port, the extra ROM space is protected EPROM containing the operating-based OS system, replaced by HES240000 that can be replaced with some large programs (usually) installed on the OS as a second machine, or a source of spare parts.

64K upgrades for Dragon 32 and 64K are possible but are not as useful as one might hope (due to the unavailability of suitable memory management chips). The onboard 64K memory switch between mem0 and 1 and the 64K0 can only address up to 64K consecutively. Details have been pub-

lished by NDIS.

The 128K upgrade available from Com puters (perfect) includes an 80 column video (probably) meant to be followed by a printer at over £100. The additional memory is configured as cache (not a cache) with a 256K (or 1M) for the 128K. Purchased second hand it sounds like it could be a bargain (perhaps want to get out of the country).

Dragonplus can be used with a 128K but the software will require a 128K update kit.

For 32 to 64K upgrades, software that enables the user to switch between programs should be provided with the upgrade. Don't worry who do not operate mainly under video of the two sophisticated DOSs in get there to be able to switch from 64K ram machine to ram machine and for example, load a file from disk patches to the DOS (which has been copied to RAM).

Use parallel, by serializing, all programs (except some DOS and the upgrade 32K of map 1) as a data store, as a graphics display area, etc. Anyone needed this?

## Plug-in peripherals

**Don interface** If you don't have a disk interface then getting one in the simplest way dramatically extending the power of your machine. There is already a wide choice — the original Dragonplus system can be obtained second-hand, but companies are still manufacturing enhanced Dragonplus-compatible systems. There are the Premier Delta system, and also a single and double density version and second-hand only. The Premier system has much to commend it, not least a second Ethernet card and although more software was made available for the Dragon/DOS system, the Delta (then group/DOS) system originating software for the Premier system. Finally the Analogue upgrade is interesting (you get a Flex and a still available). Unlike the other cards, don't mention it, which can be used with their own built commands, the Analogue requires the use of Flex (and also RAM) to a 32K machine to facilitate this. It is not cheap, and probably not for a beginner at all.

**Additional drives.** If you already have a disk system, but only have one drive, you might want to add a second drive. This will make any difference to your disk operations. If you have 64K you'll agree with Data Project that two drives are essential for almost all DOS files. But even using Dragon/DOS DOS, a second drive is a big step forward.

First advantage is in backing up a single file only a fraction of the time of a single

drive backup.

In many DOSs, COPY will not work on a single drive system (instead in systems which produce 64K files or where COPY allows resending of files it produces a duplicate of the file on the same disk).

But the real advantage comes when the user designates one drive for read and write operations and uses another for read only. A substantial application and all files can be kept write-protected in drive one and all updates and data storage done on drive one. File handling applications can be purchased or written that access data through a single disk in length, protected for the long read into memory when required. Although this is a feature of DOS, it is a disadvantage with Dragon/DOS.

If you have an original Dragon, Data Project added 40 track bit height just a second-hand high drive and a completely second-hand drive (using a Flex card). All the cables and connectors are ready for you. You'll already have a jump on anyone of the drive (not a bad one) and you may want to choose a 128K monitor. Then the question of what kind of drive to add arises. The choice of disk size needs to be considered. There are drives with a relatively unpopular format and disk are expensive. However, the single sided drives are available, cheap, and are obtainable for under £20. They are to be particularly recommended for use with hardwired or young children. It is quite happy for my 4-year-old to use to insert and eject the disk into their three disk drive.

The three and a half format is also popular and more popular. However, their popularity means that drives are not so cheaply available. However, as high capacity formats become more popular, older hard disk drives may be utilized on the 3.5 inch format market cheaply.

32 of the cheapest disk format is the 5.25 disk. The drives may cost a bit more but a 5.25 disk is considerably cheaper. Presently, at high street prices, the cost of 32 disks with data exceeds the price of the drive, but the same amount of data would purchase 100 5.25 disks.

A matched pair of drives is the most effective option. Single 40 track bit height drives are relatively unpopular now and should not be obtained cheaply.

Arguments can be had with double sided 80 track drives as they have gone out of fashion. However, when the 128K (unless they are 128K double sided) you want to be able to read them, commercially supplied Dragon software and Dragon/DOS will do. Dragon/DOS will use 128K bit problems with 80 track formats.

If the drive does not match your own, you'll get the same stage of difficulty. You'll be adding a higher capacity or different a drive. Buy a pair.



**Outrigger port expander:** If you make much use of the expansion port, you'll find the contacts become loose. The remedy is as simple as powerful: connecting one piece disconnected another as it would be. I've could connect several peripherals to the expansion port for. Some users allow page backing of a DOS cartridge, eg. The Touchwater Graphics Tebbit, the novel Pretext! modern package. This works because the DOS cartridge uses only the lower 64K of the cartridge space, and the operating software of the application cartridge (I believe) uses the upper part. There need be no clever electronic paging in and out of ROMs.

The snag with these page-back systems is that they'll only work while the conditions they assume still exist. Plug in a Delta or a Curious cartridge, at some one bring out a new or unfilled DOS, and the space the application cartridge needs is no longer gone. There is also the question of how often you want to use the application — suppose you have a modem and a graphics tablet — you can't double page back them.

A clever and more flexible solution is to attach a Cartridge Port Expander. There is a school of thought — Tandy's Multi Pak was built for the Color Computer requires a significant cost on before should be used with the Dragon, but after we've seen it has the advantage that a number of Tandy peripherals were designed for use with it. On the other hand, not all these peripherals work well with the Dragon (see later).

Compuser has marketed a user manual to Unicity Base, and that and examples is the Vivent expander board, arguably available through the long-defunct Dragon Computer store group.

Each unit offers four slots where you visually there was one, and software need bring between slots is possible, it is therefore possible to transfer data from a device at one slot to a device in another controlled by software. For example, transferring data between Dragon/DOS and Delta/DOS, or taking the best use of the facilities provided by the Cartridge Port Expander may require the writing or purchase of specialized software. None of these units is available now, and second-hand users seem hard to find. The original price was relatively high (£100-£125). There is scope for smartly again to reduce one of the Delta designs.

**HS232** This would I think a plug-in would mainly be of interest to the DOS owner. However, users of dual ported printers may wish to communicate without connecting to the game.

The HS232 port could be used for parallel or serial ports. Pretext!/Teletext/On-line/Bus board applications, speaking home terminal direct commercial software is different concept.

If you find that your dual station with the Dragon carries on the display device inside the keyboard, covered up a terminal in the HS232 could be a useful safety solution. As an Hewlett 2080 terminal was recently advertised in our local paper

for the very modest cost of £10.

Getting a number of Dragons (or Co-Cos) linked via the HS232 could be an inexpensive way of providing backups with a computer each, and saving the cost of peripherals. The Tandy Delta HS232 pack works well with the Dragon, and is supported by OS-9 modules (provided in CoCo OS-9 issue 2) to work from the Multi Pak.

Compuser has an HS232/40 and which offers additional facilities and a full 25 pin D socket HS232. The original Microcomputer Resources Cartridge DOS modern link supports Pretext! coming (but does not) not down to the disk. The appended version by Pretext! I haven't yet tried.

**Sideways ROM:** One of the last uses of the BBC that was attractive many enjoy, age was the ability to page in and out of a bank of sideways ROMs. The sideways ROM card, now available through Dragon users the opportunity to select from a bank of up to 16 ROMs. The unit plugs into the cartridge port to prevent disc use, unless used with sideways port expander. Compuser has shown that the unit is NOT as it stands compatible with CoCo but a minor patch to the operating software should not hurt it.

As the design process and a suitable, by simple design, and suitable recommended by a suitably motivated entrepreneur. There is the advantage of being able to switch in an in-line assembly (the same unit) — a word processor or old text-based or a spreadsheet as an unexpanded DOS with no memory overhead. Advice — get one if you can.

## EPROM programmer:

If you have a 6541 or an HS232 cartridge with a DOS, any Eprom programmer that receives data via an HS232 may be used to program Eproms. However, Compuser's unit is not the plugged into the expansion (cartridge) port with onboard software.

Update and debug your DOS chips. Below information ROM for use in your sideways ROM cartridge. For the relatively large Compuser's Programmer enables the user to blow Base programs onto Eprom for use in the sideways ROM cartridge.

Make use of the full 16,768 of the cartridge port — you would be surprised how few cartridges make use of even half of it.

The only snag is that small (128K) Eproms are becoming expensive and scarce. Invest in an ultra small Eprom eraser to wipe games cartridges and use the Eproms for utilities.

The Compuser's Programmer can read and program software for other computers.

The Programmer cartridge is not very easily used in a cartridge port expander since these tend to be cartridges vertically with the bus towards the front. An eraser (don't use later) is required.

CoCo users should again note that the Compuser's unit is NOT compatible with

their software without a minor patch to the operating software.

**Speech island cartridge:** Visually disabled users can speak with the Tandy young children may find that a cartridge which speaks all things output into articulating sounds, formed by an extremely valuable aid. Most notably the entertainment value of the talking computer. Delightful little aid as well as the educational children. The Tandy speech sound cartridge is totally compatible with the Dragon and in addition to speech can be programmed to provide sound effects and music in three voices. That said, programming it is not a trivial task, and no Dragon compatible software exists (that I am aware of) to make it easier. However, for the brave and the bold the manual supplied is a guide otherwise, simply using the programmed in speech is easy enough, however. The unit contains 28K of RAM buffer on speech and sounds can proceed without pausing the rest of the computer's activity. The speech is provided by an and is of high quality that perhaps equal to the highest speech from today's generation of mainframe. It is highly usable in a variety of applications. If you have bought the software, Compuser's aid with the expander (I assume) that unit is far superior. This point that unit does not appear to work with the Dragon 32 via a Multi Pak either. I don't know why. Interestingly, CoCo DOS users can a suitable and speech sound cartridge is located in computer magazines (I think that the someone else should get a copy of this — a music composer program — the highly sophisticated).

Co systems are produced a speech sound cartridge for the DOS that I've never seen. I do don't comment.

**Orchestra80:** This unit is really only of interest to CoCo users. It is a very good, expensive to operate it from the Dragon, but the synthesizer keyboard directly so you need to work out a key assignment chart. Also, the most sophisticated function of one and HS232 VC are only available to the CoCo user. For the most the unit provides 5 voices, two channel music synthesis is high quality, and a built-in pack with several melodies and chords, load from memory. Details. Users are invited to contact me in exchange for this.

**Dragon's Claw:** Lynette introduced this unit when she visited the BBC user group. Relatively cheap and pretty limited the DOS cartridge, it appeared quite useful. However, the driving camera that was advertised (see the 1st column) is gone, and of poor resolution. It is also the case that the user port is not properly well supported in the Basic.

**Map:** There are three Dragon specific kits available from Maples and several Dragon related projects were published in electronics magazines.

**Extenderport:** This has been the simplest construction project. The complete version (hello) can complete the sideways

The unit is simply a small PCB that fits into the connector. In the card edge port is the actual plug from the computer case and extends through 90 degrees.

**Modem interface.** Perhaps the next move might be to attempt this device. It is rather more complicated. The computer will allow the OS/2 user to connect to a modem. At about \$194, it is much cheaper than any competition. And it is available.

**IO port.** And a device will do will allow you to have a number of expansion of the computer. You could then use the relay to control a video relay switch house lighting on and off according to programs (eg while you were away on holiday). Or even a switch for your video recorder.

Building a project from plans published in a magazine is a more difficult enterprise than putting together a kit.

## Hard disc.

Small (2 or 3.5 inch) hard discs are being unloaded cheaply. When used under OS/2, a hard disc really lets loose the power of the operating system. The \$4K memory real-time is truly awesome by the vast storage space on-line. A hard disc can be attached formerly connected to a Dragon, although not recommended for OS/2 yourself. Unless experienced, installing and connecting the hard disc controller and drive is simple enough — wiring it into the circuit board however is tricky. I hope to be able to write on this in some date in the future.

**Display device.** Computers are often compared by Joe Public on the basis of the display device — the number of colours, graphics resolution and speed are subjectively compared. The new generation of

machines have pretty graphic interfaces and custom chips to enhance the speed needed on and colours in graphic display.

The display device in the Dragon has always been a weak point — the 50 by 16 colour case only window (blank border around the active screen) looked dated when it was introduced. However, time passes.

CompuServe will sell the Dragonplus, in addition to the ram it provides an 80-column full screen display. However, I understand that it is more expensive. I do not know whether high resolution graphics are supported through it.

It would be desirable, don't you agree, if a modern multi-colour display device offering all that is expected nowadays — upper and lower case 80 columns or more by 25 or more lines, refreshable, shareable, multi-colour and high resolution graphics could be developed at a suitable price.

# Dragonsoft

often appear in the same places in different games which means that after having played the game for a few weeks a person with a good memory could be able to come up with the start without the opponent getting a try.

The game is for 1 to 4 players, although it is not very interesting for only one. For repeat players it is a good game. For you choose two squares to uncover the objects beneath. I think that the number of the letter could be increased. It is a good idea already been considered you are told that it is a good move and a selection out of ranges ignored, allowing you to choose objects if the objects match you are allowed two more squares until you fail to match when it is the next player's turn.

On a success of match you are granted with a quick burst of fireworks. Keep playing On My Head and move to the end of the game. If two or more players tie for last place then the game is declared a draw as the winner is determined by a random number generator. To sum up, this is a game which is easily but effectively done and I appreciated the little touches of humour in the descriptions of some of the objects.

I would have preferred choice in the degree of difficulty with a hint and/or hint in between these two. My advice to new players is to keep it simple, enjoy playing this game as nobody should win it all so not having this type of game there is certainly a shortage of any kind of advice.

lateral software and more, some programs should be encouraged.

When my Dragon was a pup we had superior educational programs even to the date I say a BBC. The label states that this program will run on Dragon 3000 or Tandy Dingo 3000 but have only run on the Dragon (both 64 and 32).

Mike 2000



## No herrings in this pyramid

**Program:** Pyramid — Amnophis III  
**Supplier:** Dragonfire Services  
**Price:** £3.95 (includes postage and P&P)

I had the start of the problems with this adventure but not of the usual type. I was unable to load it so I found Andrew (not a telephone number) and he explained and sent out another copy immediately. As this one also failed to load I had a different approach and borrowed a Dragon 32 as I have a 64. In and behind half a cup of tea I had the copy loaded and I was able to load it. I had a different approach and borrowed a Dragon 32 as I have a 64. In and behind half a cup of tea I had the copy loaded and I was able to load it. I had a different approach and borrowed a Dragon 32 as I have a 64. In and behind half a cup of tea I had the copy loaded and I was able to load it.

When it is loaded you are

told that you have to find the mask of Amnophis III and return it to the starting point with other treasures that you will find on your travels. Directions cannot be input on a single letter and I think that this detracts from the enjoyment of the game. However, that is more than made up for by the plot and the challenges which give no leader in your travels.

I need especially the little touch of no deaths or serious damage caused despite your attempts at violence. I do not like adventures which are made too complex by requiring completely illogical actions in order to complete them. This one is certainly not like that although you do have

to think hard about what use certain items have.

One of the points that you require is in a seemingly illogical place but a clue is given to the freedom by an action you have to take in progress made (I happened to see). You are told the number of items you can carry so thought has to be given as to what item will be needed where. The cave map is very difficult as mapping helps you to get on to find the objects but then you seem to be in a different location when you try to return your steps, although it is so possible to get out if you persevere.

I nearly missed one of the items as the clues are



# Dragonsoft

Continued from previous page  
applied to the handwriting  
software but carried on and  
suddenly came upon a dis-  
tinction between the two soft-  
ware, which led me to a very  
important item. There are no  
written copy of the software  
and everything that is on  
tape is not ideal. I've been doing  
the software as there is at least  
one other there.

After all I really enjoyed it as  
well as every other software. Although  
I might be expected by having a  
type DCS N, as I had an every  
month change I have been  
found this software on a tape.  
I had then not to change the  
speed game and the machine  
continued I have continued  
Andrew Hill to others but of  
these problems and he  
advised me that they would  
never have it waiting for it.

Handwritten: as if you want to buy  
a piece, tell him what you  
want to do so that you can be  
sure of a working copy.

I wish programmers would  
not put in the speed game  
without a question about  
whether your machine can  
handle it or not at the very  
beginning, as I had not one  
and I know of others who  
will not use it at all. It also reduces  
the number of machines that  
can run these software. I think  
that this is the software, but  
continued adventure and it is  
not presented as well on  
screens as some of the others  
we have noted to but use the  
actual adventure at one of the  
best I have seen across and  
will really buying when the  
problems are sorted out.

Mike Dool



## A handy new Boot

Program: **Dragon Boot**  
Supplier: **Dragon Software**  
The North Star Road, North  
Derry, Antrim, BT20 9DP

THIS is a useful for file which  
will install a Boot facility on a  
Dragon DCS disc. It will work  
on Dragon DCS V103 Super  
discs, the Superdisk V85, Supadisk  
V85 and Gamma DCS 100 at  
least, and may be discovered to  
work with other variants.

Although BOOT is a standard  
facility the Dragon manual does  
not give any explanation as to  
how to apply it. Several methods  
have been published in various  
magazines however, although  
these can be complicated and  
often involve the use of disas-  
sembly of Dragon DCS or Dragon  
Boot discs themselves.

Dragon Boot will check that  
the necessary sectors on the  
disc to accommodate the  
BOOT facility is not occupied  
by existing data, up to 16 jobs  
are in a BOOT sector on  
an existing disc. This will only  
check for data that has been  
introduced using standard SAVE or  
FWRITE commands. Data that  
has been saved using the  
SWRITE command should not be used un-  
less that data is no longer  
required within the program itself.  
A new disc should be for-  
matted with Dragon Boot before  
using Dragon Boot.

It also works with Dragon Boot  
is formatted the BOOT sector  
will be deleted. The program  
will of course also check to  
see if there is an existing BOOT  
sector on the disc and give you  
the option to overwrite it with a  
new version if you want to. It will  
also protect the disc, making  
locking on the disc, it prevents a  
locking overwriting by normal  
SAVE or FWRITE commands,  
but it will be destroyed using  
the SWRITE command as  
disc should be taken with any  
program that uses the com-  
mand. Dragon Boot resides on  
tracks 0, sector 3 and will only  
require the least disc memory  
space by 256 bytes.

This may sound very compli-  
cated on paper but it is really  
very easy to use as having  
done as checks the program  
will actually tell you that you  
cannot use the disc if the  
BOOT sector is occupied by  
data, when it disappears you must  
first move the data to another  
sector to reform the disc, and  
then give you the option to  
QUIT or restart with the file.

The program also enables  
you to select one of up to four  
disc drives which upon select  
facility in use it asks which  
file name you wish to BOOT  
a regulars a sharpshooters. You  
try to do together with that  
similar. Source code that pro-  
gram authors love to reuse.

Overall a very handy package  
at well worth the price.

A. A. Newton



## Done in a Klik

Program: **Klik Utility**  
Supplier: **Harms Micro**  
Software  
Price: £1495

NEEL Hixon said if some-  
one could do a mouse of ALK  
for Basic42 by Harms Micro  
Software, Harms is my tradition.

First there was Basic42, a  
text-screen driver game 42  
by 24 text text screen, plus  
the ability to run on the Basic  
42 by 16 text screen at well. On  
booting the disc the system  
patches the DCS into 64K  
mode, copies the DCS and  
Basic from mag 2 to mag 1  
into the Basic42 into the  
upper 16K of the cartridge  
area (occupying only 4K, the  
remaining 12K being reserved  
for Basic42 data) using  
the full 2000K Basic area for  
its use.

The utility package is  
Special and Typewriter which  
turns your Dragon into a typewriter  
and gives it a printer buffer of  
32K, allowing you to type and  
print the same text. This is  
followed by DCS Utility, a per-  
manent menu and window  
allowing use of DCS com-  
mands using the cursor keys to  
scroll up and down the menu.  
Then come some which are  
compiled into so that I haven't  
got right into it yet and now  
there is Klik!

ALK is a multitasking  
emulator. Basically ALK con-  
tains all the above utilities, but  
more gold data and enhanced  
and allows full disc control via  
keyboard or joystick (possi-  
bly) using the keyboard only  
to open. Full use is made of  
full down menu (there are  
one at many). Each menu  
allows drive definition, window  
size and position, file type and  
disk commands. (On the  
Basic DCS or Basic42)  
There are three menus with a  
lot of status commands in  
each - without counting  
about 160 plus are available at  
the touch of a key.

Menus available are main  
edit DCS color develop-  
ment speed camera and  
macro.

Alt allows full editing  
facilities and program run.

DCS is a data management  
menu. A full disc requiring  
PROTECT ON can be done  
one file at a time or less than  
five minutes, without touching

the keyboard.

Dragon can be used to edit  
up the next four addresses  
or they can be called up on  
their own.

Items is a set of side pads  
written by you and stored on  
a disc to recall.

Spoofer has a printed output  
to disc for printing at a later  
time.

Camera makes a hard  
screen to disc file. I haven't  
used this one yet.

Alt is a very fast and per-  
formant for getting to existing  
files in Dragon often. This  
was written using Java.

One other which is on the  
disc is Release. This allows you  
to write your own macros and  
windows for inclusion in your  
own programs.

As an example, power up  
main ALK disc, power BOOT  
and cursor keys to select  
MOUSE, enter the file you  
are in the pool file mode.

From now on, when you  
destructive, cursor under  
your disk control (use the button  
to enter). Now enter RUN or  
LOAD (Available) to proceed.  
You will now see a new type of  
DRI, the cursor over the re-  
quirement. Now move the cursor  
to the bottom for button DRI  
press key. Your selected job  
will be loaded and run.

The above is a very fast  
description of ALK which  
must be used to be ap-  
proached. My own opinion is  
that it was not produced early  
enough to keep Dragon in-  
teresting.

Full marks to Harms for the  
time and effort that has  
gone into it. All hardware  
is a superb job and I have  
used the processor on the same  
lines. But for all these who  
have not yet purchased any  
other above so so you need a  
64 and disc drive.

One last Basic42 on disc can  
be used as a screen driver  
for your Basic program and  
after your first and final use to  
put the 42 column screen.  
It does look a lot better.

Mr. Hixon can be found at  
Harms Micro Software, 43 Ab-  
beys Road, Middlesbrough  
TS6 8P. Tel: (041) 570 8338. He is  
very helpful.

F. J. Parker









### Register Size

Most Significant Bit and	Least Significant Bit
7 0000 0011	0 0000 0011
15 0000 0011	8 0000 0011
31 0000 0011	16 0000 0011

decimal representations of on-bits. The 32s and 64s in 32s mode have all three memory locations accessible — it is just that the locations above address 32767 can only be read, not written to (Read Only Memory — ROM). Most values, often in comparison with up to the next four adjacent memory bytes, represent a legal state machine code instruction, as is suggested in previous articles; if we direct the computer to any address in its memory without first to obey the contents of the bytes involved, even if they were legitimate program instructions.

However, it is not who are the words — the computer merely obeys but controls — and thus, supported by the instruction set, the value in a byte can be fairly things depending on circumstances. This byte with bits 0-7 is and so on. This is the value 847 or in decimal 78 is a part of our program. It would be the computer instruction.

### CLRA

CLRA register A — set all to zero. If it is not a byte with a message that we are displaying on the screen, it would be the capital letter O. The calculation is based on the location of the O in the table and value being set to zero, representing value 0. The condition is that the value is 0.

Numeric values can have a further dimension. A byte can contain a decimal value of up to 255, what happens about negative numbers? This is achieved by using the most significant bit of the byte, bit 7, as a sign bit.

0 = positive number  
1 = negative number

Because of a bit being used to indicate the sign, only seventeen of the byte is left for representing the value, approximately halving the positive maximum value (the bit representing zero and 128 is used for the sign), which is where the range +127 to -128 comes in. The only other eight combinations is that although 1 point for a just bit 0 of a byte, 1 negative is NOT bit 7 and bit 0, as negative numbers are being in a form known as two's complement. The bit pattern for a negative value can be determined by subtracting the value from 256, for example 1-256=-255 or 847. The contents of registers A and B and single memory bytes can be manipulated pointwise to negative, and vice versa, using the NEGATE instruction, just the difference from the COMPLEMENT instruction for simply reversing the state of the bit set, so that a value of 255 (-1) in memory would get 001 (-256) when an AND NOT COMPLEMENT instruction (AND NOT) is set (inverted). The latter may be described as one's complement or one's

two's from the first complement (first of positive and negative numbers).

As far as it is that this code explanation are concerned, values in a byte are set as they are to be most programs at this time. For instance, a byte contains 255, it may be regarded in context as:

- an unsigned decimal value of 255
- a signed decimal value of +255
- the last character 'P'
- bits 4 and 5 of a byte set

If the value exceeded 255, that is, bit 7 is set, there is no normal eight value but is associated with a two's again, the contents of the byte can have a number of different meanings, according to the context, for example:

- an unsigned decimal value of 148
- a signed decimal value of -107
- bits 7, 4, 5 of a byte set

Double bytes are 16 bits wide and the concept of doubling progression must mean to the left of the byte, and progressive, bit 7 being worth 256 etc. (though it is 16 being worth 32768 with all 16 bits being set, 65535).

All unsigned values are regarded as positive values, signed values are positive if bit 7 of a single byte (bit 15 of a double byte) is 0, negative if bit 7 is set to 1.

The important thing to note is that in our programming, it is that we do not also actually use signed rather than unsigned instruction and vice versa. For instance, if clearing an area of memory, an efficient way of doing it would be to give code to register A or B and use that as a register when CLRA or CLRB is required, keeping track of all positive bits.

LEARN MEM PC  
LDA #255 is clear 16K bytes  
address MEM+MEM+255

LOOP CLR A,X  
DECA  
BPL LOOP

### RTS

RTS MEM+255

An easy tip to make is using register off sets in particular and single byte counts when there is the possibility of sign bit interference. (Note are regarded as being signed values (as may be in the range +255 to -127) in 32s mode, single bytes +255 to -127 in 64s mode, in double byte values for example register D offsets.) If the area to be cleared is say 255 bytes long and a single register offsetted at 192 is set up, the value has bit 7 set (BCL), the first address to be cleared will be seen to have a negative offset (+192+signed value of 63) with the result that the first CLP would actually clear memory address 255-63 rather than 192+192 and the loop will terminate immediately as the BPL conditional branch would fail (the result of 7 of register A being set (=negative)).

The negative interference is something to watch out for if using the LDA instruction for arithmetic. Using a constant offset (eg LEAR 255 X) will not cause problems as the assembler will generate a positive double byte offset value. The problem is that it is varying the increment value using register offsets and may be absolutely out of the range of values and adding with code and code approximately using double byte register D if it is positive value +127 will never need to be added.

There is one method of adding a single byte positive value (+255 to register — the AND instruction) to the unsigned—possibly treated contents of register B to the contents of register A. It is difficult without decimal examples on it.

I am sorry that this is a somewhat less than satisfactory article, but we continue to work on it all part what we have become of it at the time. I think would align with the Sun Microsystems for the two years of Oregon User for the magnitude machine.

```

5001  + LISTING 1
5002  +
5003  + INDIRECT (FILENAME)
5004  +
5005  + USING DREAL AFTER
5006  + CLEAR 200,400000
5007
5008
5009  LDA B0
5010  FDB 0
5011
5012  B0
5013  LDA #T
5014  STA IADDR,PC1
5015  RTS
5016
5017

```

```

10 PER LISTING 2
20 B0=H0000;PARAM=H0
30 M0=H000;M0=H000
40 PRINT M0
50 M0=H000;M0=H000
60 PER PARAM,PER I000
70 PER PARAM,PER I000
80 EXEC M0
90 PRINT M0
100 END

```





7F92	7F93	ORG	87F91	7FC7	8D33	BR	BR
7F93		PUT	84E21	7FC9	3586	LD	PULS A, B, X, Y, PC
7F94	3486	PRGR	A, B, X, Y	7FCB	1080040E	SR	LDY
7F95	808A77	JSR	88A77	7FCF	8C84	LD	LD
7F96	308C48	LEAR	PR08A, PC8	7FD1	8DA3	STD	Y++
7F97	318C53	LEAY	PR08B, PC8	7FD3	8C02	LD	2-X
7F9C	8C0148	CMPT	8C148	7FD5	8DA4	STD	Y
7F9E	2714	BD	MP	7FD7	31881E	LEAY	30, Y
7FA0	84D147	LD	8C147	7FD9	108C08FF	CMPT	8808FF
7FA4	A760	STA	-Y+	7FDB	26AF	BR	LD
7FA6	867E	LD	867E	7FDD	39	RTS	
7FA8	870147	STA	8C147	7FDF	3410	PR08B	PR8B X
7FA9	FC0148	LD	8C148	7FE3	8C076C	LD	81900
7FAE	8384	STD	-Y	7FE6	301F	L3	LEAR -1, X
7FB0	8F0148	STA	8C148	7FE8	8C0800	CMPT	80
7FB2	308C8C	LEAR	A1, PC8	7FEA	267F	BR	L3
7FB6	8D13	BRP	SR	7FED	3510	PULS	X
7FB8	2C0F	BRD	LD	7FEF	39	PR08B	RTS
7FBA	A4A0	LD	-Y+	7FF0	39	RTS	
7FBC	870147	STA	8C147	7FF1	39	RTS	
7FBF	8C84	LD	-Y	7FF2	538C4F37	W	PCC /SR, OR
7FC1	FD0148	STD	8C148	7FF6	464E53F5	W	PCC /FACT7
7FC4	308C8F	LEAR	82, PC8	7FFA			

You should know that each Dragon memory unit can sleep 256 slots. This means that a byte, 16 or code anywhere number from 0 to 255. A pair of bytes can store any number from 0 to just over 65000. If the bytes are 16182 then the number is 26816+182.

JMP, JSR and RTS differ from their Basic counterparts in that they jump a memory address rather than line line. The JMP and JSR statements each use two bytes. The last two bytes specify the memory location to be jumped to. RTS only uses one byte.

## Dragon not amused

Dragon puts aside three memory locations 359, 360, 361 (sometimes called a hook) especially for the purpose of hooking code into CHAROUT. CHAROUT contains the instructions JSR 359 to jump to the hook. CHAROUT expects a return (RTS) and it doesn't get it. Dragon is liable to get very cross.

359, 360, 361 are RAM and so any byte values can be stored into them.

SP is C's register to cause SLOW FORKS in JMP to SP's A1 and use FORKS to return to normal. SP's B1 routine is the

end of A. It could be put RTS and so cause a return CHAROUT. Well it is not so easy as that. I never do.

The question is: what was in the book before?

It always a good idea to have a look. By looking.

## FORN-388 to 391 7FEE88 NEXT

You can do just that.

If you switch on a Dragon with no extras you will get 57257. Now 57 is PC8 and 5 is return code through basic CHAROUT. Obviously only the first 57 is needed. The 5 is ignored. If you are filled with a Curious DOS the numbers will be 126 194 80. On first switch on Dragon had put in 57257 but the DOS immediately coded in 126 194 80.

126 is JMP. The 194 80 specify where Dragon is to jump to. The two numbers are treated as pair. The location is 194 times 256 plus 80. That is 49784.

Sooner you know that Curious DOS has a fault in starting at address 49784. If you think about it a bit more it is a fault at all. If you get out of the DOS then all the instructions become valid. This makes it hard to corrupt the disc but it is not what you want.

If you have a Curious DOS the numbers will be 126 216 288. If it is a Curious DOS then Dragon DOS users is a CHAROUT table.

## Back on the hook

Before putting in the jump to SLOW, C must put what was in the hook into the A. To return to normal C must return to the hook as an input code.

Turn up where C is located. Hook to see if the JMP (to A) is in the hook. If this is not so then the contents of the hook are put on the end of A. C can now put JMP (to A) into the hook. That is, A (to A) is installed then C goes back the original contents of the hook. To return speed to normal. If you now look at the assembler listings you might expect to recognise some of the numbers. Well you could if you know it. 57E is 126 126 is 57 256 126 126. If you have a Curious DOS why is the value 49784 or 38 28 38 and not 57 257? Well C hasn't been located yet. When it is, C is 57. Should be there.

I apologise for the whole Dutch. But please read Fern O'Arcy's art this or not. Good hunting?

## Listing four

7F91	7F91	ORG	87F91	7F92	A4A0	MP	LD	-Y+
7F91		PUT	84E21	7F94	870147		STA	8C147
7F91	3486	PRGR	A, B, X, Y	7F97	8C84		LD	-Y
7F93	308C28	LEAR	PR08A, PC8	7F97	FD0148		STD	8C148
7F96	318C18	LEAY	PR08B, PC8	7F9C	3586	ENDC	PULS	A, B, X, Y, PC
7F9C	8C0148	CMPT	8C148	7F9E	3410	PR08B	PR8B	X
7F9E	2714	BD	MP	7F9C	8E1900		LD	81900
7FA0	84D147	LD	8C147	7F9D	301F	L3	LEAR	-1, X
7FA1	A760	STA	-Y+	7F9D	8C0800		CMPT	80
7FA6	867E	LD	867E	7F9D	267F		BR	L3
7FA8	870147	STA	8C147	7F9E	3510		PULS	X
7FA9	FC0148	LD	8C148	7F9C	39	PR08B	RTS	
7FAE	8384	STD	-Y	7F9D	39		RTS	
7FB0	8F0148	STA	8C148	7F9E	39		RTS	
7FB2	308C8C	LEAR	82, PC8	7F9F				

# Ossett '88

*Helen Armstrong shows up at the show*

OSSETT Town Hall is no noble pile as it appeared in last year's Dragon Clear photographs. That was my last visit to the popular Northern show site. Having survived kamikaze cosplayers (nearly on to avoid the) we rode traffic jam-packed into the car park by the Motorways authority for the bank holiday pressure, or left motorists broken up a car light in Sherfield, dodged the local football gathering and almost misread it as Ossett just south of Leeds. I found myself driving round and round what must be the world's shortest integrated motorway of the little cupola at the apex which has been repositioned of the Town Hall as I tried to find the nearest car park.

As usual the nearest car park, and the second nearest one, are just round the corner the entrance west motor.

Ossett is not so much aware with a Hall as a Town Hall with a town attached to a massive Hall, as well as plenty of room for tables and exhibits, there is a pleasant bar serving every dainty item from beer and sandwiches, and plenty of chairs on which to sit and enjoy them.

As DragonClear had no committed ticket to a stand, I was for the first time in history able to go right round the show and have a word with nearly everyone there, with the exception of many Whitehouse, who was scattering just as I arrived. (Mostly personal: the day was winning on and many wanted to get home to babies.) So I never did find out whether he had brought and sold one of his latest new 'cups' etc. This means seems as if, having found after all — a victory at last? — that he came to the new show at least for 'Hail' but coming to the new one after today's showed a party indicating that I had been good.

## Talking heads

I never did find out who was going to John Penn. How many people had been off? We don't really count heads any more, and John, like Countess Mary at the end of the day — that excellent reference I like as a postscript to a counter show. This show I gave. There are already building for a show in London in the autumn, although the organisers agree that they will have to try and cut the overheads on the 1989 show. Too many things are different, and the extravagance at eleven pounds special, or was it eleven pounds for me, in the past, is a little bit more. The matter is, in part, it is a little bit more of popping out at the weekend at half the and in the hall.

I was especially pleased to hear that Pam Dancy's House One, really going on in a limited place, wrapped with full printed instructions, interestingly very well

Pam was sounding more optimistic about the chances of her landing another party last time she wrote in Dragon Clear perhaps this is the reason why.

In the meantime, I was assisted by a weird, David Males, explaining that Gordon Lee (who showed Peter Males in his movie's DU) must have dated something by mistake, because all the in studios were within the program — pages of them — and he had to have mentioned the legality of them, which was one of the last bits of a CD, a guide to the magazine as we had them and see how adequate they are. But it does seem as if something was missing and I promised to report this with Gordon. David also mentioned that he doubted that he would be doing *More Males 2* now — the real reason, although necessary after calls on his working time, etc. He referred slightly and said that he might if he had a financial advantage. Where have we heard last before?

Next along, Jonathan Cartwright was demonstrating his recent release *Spy Against Spy*, available from Peter Bell, who also took some release. (Globe is a big world shooting game, which has still working on.)

What about the new *Whitehouse*? I heard from the last time that it was a big success, and I've got it in my hand and will have copies of the new edition made soon. But so far the only person who has come across it while playing the game is Mike Scott of N&AP. Yes, this is up with the new coming into the DU office — there was a big success despite the fact of the game, but everyone who has played it and said on a review has said what a good game it is. However, Bob Preston, who's selling *Whitehouse*, says that he can't find a title.

The N&AP side, manned by the distinguished Mr Scott was looking some of the (Globe) hardware software and selling a lot of diagrams and various hardware played effects (including a lot of new) for converting the Dragon 32 into a Dragon 64. (Scott said and Mike said I don't want to buy one — I just wanted to see how much paper I covered.) We had a good proposal for the conversion once and a half an hour for pages.

People have sometimes asked why DU has never published a conversion for the Dragon 32, and this was a very good question. I said that I had been in every month at All the Own Risk after and we don't need to be so much people who aren't experienced enough to go ahead and try it. How you ever seen the amount of mail a worldwide computerised hardware project generated? I used to work on a hardware magazine, and I still have the magazines. N&AP, however, have the place.

Mike escorted the eagerly waiting most (Braham Smith at Orange Software) computer and a strange short (but as far as it is) to the show. This may have to do with the fact that Orange were showing several new games as well as the new range of Quake and other titles on disc, which have been licensed by CompuServe. I saw just got Harry to sign the contract, and (Braham) signing the book. The deal was selling until the show price, a little lower than the normal (a little cost. Mike gives on cassette from Orange include *Lupton's Kingdom*, which Mike had off with. The *Lupton's Kingdom* Part 2, The *Jumpy Home* and (uniquely) *The Great Fish War* (which I saw from that Mr. Van Soetel) was in fact a Dragon DU reader were quickly scotched.

## Preston plonker

Bob Preston of R&AP Preston had his table covered with demo goodies as usual. Some of them were quite limited to the show (Dragon) show? No idea, it's a black Dragon/Dragon — not exactly I've been taken in for the last time. Where did the dust covers and the supply of 1984 Dragon Users come from? From Harry Whitehouse, of course. As Dragon users are interested in special and (Braham) transfer stock from top-up new tapes. Old Dragon gear never dies, it just finds a new home. As well as publishing new software, Bob specialises in selling old and reuniting the old. I was looking quite pleased at a moment, having come up from his home stamping ground in stinky Wales for the day. (I'd like a plastic plonker?) I don't care what your words are made of Bob — oh yes. The Plonker is a big little head rack for moving your discs in while you work. With a piece of strong sticky stuff to adhere it to the side of your monitor or printer. It's steel and spiral bolts (no discs) against the more coffee mug accidents, and I thought I suspect of having been used with 3.5in and 5.25in discs in mind, it will take 5in discs quite happily. It will actually take more than four 5in discs because you can get two to sit without touching each other. I can't remember how much he said a cost, but it was a very cheap one. I saw you write to R&AP.

I was also in the business of showing prices for Dragon (and) *Snail*. I was told that it was a bit of a Mr. Preston himself and George Cartwright on the grounds that the two of them would be difficult and expensive to present to the owners, but I saw a very big bag full of the Dragon Five Games Pack, incorporating *Whitehouse*, *Cost Plays*, *21*, *Route*, *Cross* and *Whitehouse* for the 32/64. I thought that this is available I have R&AP for those of



# Basic09 in perspective

*David Rothery examines the virtues of 'the Basic that thinks it's Pascal'*

The Microsoft Basic that comes with the Mega-1 is undoubtedly one of the best and most powerful Dragon-160K processors is capable of. It is the best, as only change it a little of the reasons may be:

- To get rid of the gaudy text screens and also slow Basic.
- To utilise the full 16K of the Dragon-1 with 4-K.
- To use a better disc operating system.
- To have better editing facilities.
- To have faster processing of repeated loops and especially in subroutines.
- To have a more structured Basic.

The last point will interest those who may think that innovations on the Basic-09 (I feel writing mouthful with scope) or who take the programming seriously enough to use a good text editor which enable them to progress to more complex languages such as Pascal will be a minimum of effort. Also, you'll be speed in the past on the Dragon-1, as they record errors on paper, dumps and on surface claims, but by careful use of the Basic program only takes two hours. When some of my own programs don't do it, some things and even I could have the machine was getting along with the speed, but a nice old Government House Warrington against using it, perhaps it should also there.

Basic-09 from Harris has had good reviews in OZ. It has an improved text screen, and word by adding to the existing text with Basic, a Windows structure, the WHIRL, and can be used and also enables window, just-down menu, and the use to be used. It is undoubtedly become more attractive as programs become available which make use of it to reduce the problems which found was to make response to the keyboard.

The other way to improve on the display and handling, it is to use Flex or OS-9. Both respond well to the keyboard, make use of the full 16K and have excellent screen displays. They both have a similar range of professional spreadsheet, word processing and record management systems which produce files which can be manipulated by Basic, however, the commonly available Basic in these two systems are different approaches. OS-9 in Flex is identical to the Dragon-1 Basic, except that it allows access to Flex's commands and data files. Also, it uses a different set for its disc commands and variable tables so that graphics stored as much the contents do not have to be loaded at a different address from their tape versions. Thus a game like Jet Core's Cricket can be loaded both tape and disk, saved to Flex disc and then run unaltered, which is not possible with Dragon-09. If

you want an improved display and file handling, but do not wish to lose existing programs too much, then OS-9 is very good. It also has windows, but no drive files. One size issue is that if you program with a syntax error, OS-9 includes the offending line with the error highlighted.

A TSC Basic interpreter is a fine, which has sophisticated file handling features, but lacks some of the Dragon's extended Basic commands such as PRINT, and has no graphics commands. However, it can save variables as a virtual array, and access them very quickly. Also the ON ERROR command allows resumption of the program at any point, including the line where the error occurred. A compiled version of the program can be generated which stores in less space. No EDIT command is available, and the error messages are a simply numbers.

If you have to be prepared to buy the OS-9 system, then you may like to consider the results of Basic-09. Since I think these are considerably I shall devote the rest of this article to it. Basic-09 was developed along the OS-9 by Motorola, makes use of the 160K processor to derive optimum results in its features. It is very fast, can manipulate OS-9 files and use all its own words from within a Basic program, but stores all its code in highly structured programs in between. When making a program, you use normal techniques, including line numbering, in a possible disadvantage is programs which have a data set, a variable to Pascal.

It starts with many types of variables are possible, and those should be declared at the beginning of the program.

DM stored, will deal as a real string variable and as in Dragon-1 Basic, although the name of the variable can contain more letters and may be in lower case. However

DM like INTEGER means that they can only have whole number values and is not as a loop counter will not only save memory but in cases applied automatically. BUTE variables are integers in the range 0-255 and take half the memory of even the INTEGER variables and a little of that of REAL. BOOLEANs are only one bit, can be used in conjunction with a wide range of logical operators including the modulus OR. This is called XOR, unlike the Basic's OR which always makes an effort of a 1.

At the other end of the scale arrays of several elements are possible and one can even define one's own complex data type. A special command enables a whole array to be copied at once into another array without the usual time-consuming

loops. All the defaults to the normal Basic and are very simple. You must ignore it the end.

The most interesting Basic in a little of the scope they are not limited. It is only the memory which is limited up to 16K, and is later and converted to machine code by the resident Basic interpreter using tape as a FOR-NEXT loop, making a number of loops will have to be made up to 16K, and then direct lines, and possibly evaluate the same formulae with different values. A compiled language will convert the whole program into object code, and save it in the form of a file which runs very fast, but cannot be altered and has been compiled. Thus you can try out one line of Basic at a time as you enter it, and change it if it is wrong, whereas a fully program in C has to be altered, however, most incorporated, the code manages to get the best of both worlds. As each line is entered it is checked for errors before being accepted, and then compiled into code. Alternatively you make whole file in this form, and it will run with Basic-09 memory using the command type you want to use. It is in object by using the PACE command, another part of the compiler is found producing a code which is not only faster, and more compact, but will run without Basic-09 being present. A special feature of the compiler is that it can be used to produce the system file whenever you type in the name of a Basic program, and the system file produces the program. However, packed programs are not edited, so the system should be saved. This also means that manual programs are packed, their content be made as desired with the use.

The list of Basic words provided is very comprehensive and the only omission likely to worry the programmer is the lack of INKEYS. However, the manual provides a machine code routine for this, which, when assembled, can be used within the system, wherever required. Another useful loop is possible, since we have WHILE and its associated ENDWHILE, LOOP and ENDLOOP, ENDIF, IF and ENDIF as well as the usual FOR and NEXT. This means that any type of loop can be constructed, including those with conditional jumps. Loops need not end with any depth, and the loops are very simple, to show the depth of loop as an indication. When reading the code, the PRINTING, data read can be seen associated with numbers. ON, GOSUB and ON GOTO are both supporting.

The biggest difference from Dragon-1 Basic is the use of procedures. The program may be divided into a few subroutines, each can be called, called and procedures. They can be called by name and can be loaded directly as part of the program, or can be loaded from disc when required. This latter feature makes very large programs possible.

ble without regard to limitations of memory. Variables within a procedure are local which means that the names used within the procedure are fresh and free of those of other procedures without causing problems. Thus stock procedures for sets etc. can be kept in a library and used where needed without alteration. It is often can be passed from one procedure to another by placing them in brackets after the procedure name. Even line numbers are local to the procedure. This high degree of abstraction makes it possible to visually eliminate the need for GOTO's (which will please the purists) and makes line numbers redundant as they are in brackets on all Basic60's.

The absence of line numbers means a different form of editor is required and has come from my own invention. I find the editor useful to use - as you can only move from line to line by using + or - where it is the number differs to move up or down. Thus search strings can be entered but there must be a table of finding words you don't want, since searching for GOTO would also find GOTO and FOR. If you want to change line numbers, the only way of doing this is to specify a search string and a replacement string. This has the same problems and you can end up with the wrong word changed. Also I find that under certain conditions the editor will build in the letters entered even though they are there in the line. In fact this is the only thing to do with it in line and also I agree. However because OS 96 itself has the same situation there is no nothing to stop you editing a Basic program using the Syntroph word processor and then reading it in to Basic60. The nice checking is then delayed until the program is compiled or runs.

Another part of Basic60 is in the way it reserves memory. When first called it only uses about 40K of space to work in. This can be expanded at any time up to the limit of your computer by using the MEM command in instruction 1. You suddenly ask for about 128K of memory it doesn't ask. Fortunately, all you have to do is keep ask-

ing for a little more memory in small steps and you're home. Also, and I'm the only person who I note it and wishing to be loved with WHATEVER, every time I make an error? Surely it's FORGIVE ME PLEASE! - or you'd be just as much and more well tried.

If you try to run programs with version 1 of Basic60, you will only get into DEBUG mode. This is quite powerful and enables you to list or change variables, introduce breakpoints step through the program line by line, list the codes in which procedures have been called etc. Of course this is far better than the messy version of TRON in the original Dragon. Don't forget that all the normal OS 96 commands are accessible during DEBUG, or from the Basic program you have written. Thus a directory of files available can be read, or files can be copied, renamed or even deleted. You could use Basic60 to create an index of all your disk simply by calling it to collect the DIR command and to output to a file you have created. Thus none of the versatility of OS 96 has been lost. You can also read the hard Diskcat on the Recordable tape mount System and manipulate them in any sequence.

The manual provided is quite good, but certainly not for beginners to Basic. The only concession to newcomers is a children's program, the beginning which shows you how to get the computer to say 'Hello!'. This section entitled 'What is a program' seems fairly necessary but perhaps to whom it would be needed would then I write the page and immediately have a heart attack.

Graphics are not built into Basic60 but are possible by calling a special module called glib. Thus (RUN GFLIB) Line 41 of x2 v2 colour will enable a colour attribute to be drawn between two points. Colours are supported but the useful DRAW command of Dragon Basic is missing. If you have version 2 of OS 96 (currently produced by Eurocard of Spain) a module called glib is supplied which enables lines and graphics to be freely intermixed - most useful for graphs etc. A sample program

called Arelty (Speedy for Clock) displays a clock which shows the current time when the program is run. It will be evident that if you use these modules, which are specific to the Dragon, your Basic60 program will not be portable to other OS 96 systems or other computers.

The very simple program I include may be used for setting up a printer before using Syntroph or PMS. Although it uses Tandy printers (and some Zeniths) it can be used for any by substituting the appropriate printer codes in lines 446 on words. The first line 446 will cancel all the other settings. After entering and saving as normal, use the PMS command to produce a compiled version at the place if in your CMS directory along with SYNTRO and PMS. If you call Tandy/term from your interrupter, the printer set up program will run and then load Syntro automatically at the end. Of course you can GRAB any program you want, or simply call it by line.

In the table the left hand numbers are the line references used by Basic60. Although much will be familiar to Dragon Basic, the uses of ENDOFF, ENDOFF, ENDOFF should be noted. Also a pointer to the number should be noted. OS 96 itself is a pointer to the actual number but is a function of OS 96 and should be responded to by the programmer. Also the assignment of values to a variable can be done using x = 1 to distinguish it from the old value if x = 1 THEN. This is special but good practice in OS 96. OS 96 produces a warning beep and CHIRP16 clears the screen.

The program first asks if the printer needs to be reset. If the answer is no it immediately loads Syntro. Otherwise into the printer, styles possible. More than one of these may be selected before a choice option 10 to leave the program, so you can have double width and bold together if you wish. It is well to use option 1 and unless you have just switched on.

As usual anyone having problems entering or using the program can give me a ring on Glosop 5912.

```

PROCEEDING tandy
0000 REM *****
0005 REM ** Tandy printer set up program **
0010 REM *****
0015 I/O PRINT CHR$(12)
0020 PRINT "DEPILE PRINTER SET UP"
0025 PRINT
0030 INPUT "Do you wish to set/reset the printer (Y/N) " : q$
0035 IF q$ <> "Y" OR q$ <> "N" THEN GOTO 100
0040 ENDIF
0045 IF q$ = "Y" OR q$ = "N" THEN GOTO 400
0050 ENDIF
0055 IF q$ <> "Y" THEN GOTO 100
0060 ENDIF
0065 PRINT "Please check the Printer is switched on"
0070 INPUT "ENTER to continue" : q$
0075 DIM printer path $ (1) name $ (1)
0080 name = "p"
0085 OPEN printer path name WRITE
0090 DIM not49 21 : STRING$ (49) count num INTEGER

```

```

00000000 continued
019F      FOR x=1 TO 2
01B1      FOR count=1 TO 9
01C1          READ opt(count,x)
01CE      NEXT count
01D9      NEXT x
01E4      DATA 'Reset/Initialise' 'Italic Style','Condensed Mode'
0218      DATA 'Elite Mode','Enlarged Mode','Bold'
0248      DATA 'Underline','Prop Spacing','Microfont'
0273      DATA ' ',' ','147','98','48',' ',' ','95','135'
02A2 300 PRINT TAB(10); "OPTION"; TAB(30); "MAX COLUMNS"
02C5      PRINT
02C7      count=1
02CE      LOOP
02D0          PRINT count TAB(10); opt(count,1); opt(count,2)
02EB      EXITIF count=9 THEN PRINT "10"; TAB(10); "EXIT FROM SETUP
Program"
031A      ENDEXIT
031E          count =count+1
0329      ENDOLOOP
032D      PRINT
032F      PRINT
0331      INPUT "INPUT OPTION No THEN ENTER TO PROCEED " num
0369      IF num>10 OR num<1 THEN PRINT CHR$(7); CHR$(12);
037C          PRINT "INVALID OPTION NUMBER"
0390          PRINT
0397          PRINT
0399          GOTO 300
039D      ENDIF
039F      IF num=10 THEN GOTO 400
03AE      ENDIF
03B0      ON num GOSUB 410,420,430,440,450,460,470,480,490
03D8      PRINT CHR$(12);
03E0      PRINT
03E2      PRINT
03E4      PRINT
03E6      GOTO 300
03EA 400 REM END & LOAD STYLE
0400      CLON #printer path
0406 405 PRINT CHR$(12);
040F      CHAIN '/cd/pcwds/style'
0421      END
0423 410 PRINT #printer_path,CHR$(14)+CHR$(27)+CHR$(15)+CHR$(20)+CHR$(
(27)+CHR$(18)+CHR$(27)+CHR$(32)
044D      RETURN
044F 420 PRINT #printer_path,CHR$(27)+CHR$(66);
0461      RETURN
0463 430 PRINT #printer_path,CHR$(27)+CHR$(20);
0475      RETURN
0477 440 PRINT #printer_path,CHR$(27)+CHR$(23);
0489      RETURN
0490 450 PRINT #printer_path,CHR$(27)+CHR$(14);
049D      RETURN
049F 460 PRINT #printer_path,CHR$(27)+CHR$(31);
04B1      RETURN
04B3 470 PRINT #printer_path,CHR$(15);
04C1      RETURN
04C3 480 PRINT #printer_path,CHR$(27)+CHR$(17);
04D5      RETURN
04D7 490 PRINT #printer_path,CHR$(19)+CHR$(27)+CHR$(77);
04E0      RETURN

```









**...and add the number you first thought of**

**Gordon Lee** feels that businesses tend to overbuild.

OVER the past few years we have, from time to time, considered a number of unsolved mathematical problems — many of which date from pre-computer times — but in which the computer has been regarded as a reliable tool where conventional mathematics has failed to find an answer. Twisted that these problems are actually all at least 50 years old, that is, that even with the power of the computer they are not going to be solved too easily, but there is one reason why the mathematicians involved may not succeed where the professional has failed. Take for example the case of the Hailstone numbers which were conjectured more fully in Oct/ August and September 1964. The odd natural numbers are numbered in ascending order:

Take any positive whole number. If the number is even, divide it by 2. If it is odd, multiply it by 3 and add 1. That will give you another number, so repeat the last as many times as you like.

The congruential method makes what number you take you will always eventually end up with 1. For example, starting with 3 the sequence would run:

2000年12月29日

As yet there is no proof as to why this should be. Why should the total for corner numbers not decrease without limit? Another possibility would be a certain series of values forming an endless loop of repeating numbers. In the absence of any proof the subject is wide open to conjecture. Items for example: by finding just one value that doesn't conform to  $\text{max}(2n-1, 2n-2)$  (Decreases in flow rate) is not the answer.

D. K. S. CHAN, S. C. CHAN, C. C. CHAN, and S. F. CHAN

northwest in predicting the a given starting number, the number of steps required to reach 1, and the maximum value reached during the iteration. In the case of 3 (shown above), some steps are repeated. Although the number of iterations required to reach 1 is only 6, arrived at by manually performing the calculation, as yet, I have not formulated any conjectures either of these values directly. A quick test with a few low numbers and rapidly shows the need to consider other values. Why, for instance, do the starting values, 26 and 28 have steps of 10 and 11 respectively, and reach minimum of 10 and 8 while starting value 27 needs 7 steps and reaches a max value of 83322?

3	1	3	9	9	1
9	8	3	9	2	9
1	6	4	3	1	2
5	1	7	4	7	1
7	1	5	9	7	1
9	3	7	3	3	9

Perhaps even more disturbing than an improved rule for which no exception can be found would be one of which only one exception could be found. All the discriminatory of West's exception might just allow his calculations but unless the president is able to say enough from which a judge's order flows. The court may might be even more possible if that a case had not been found. A few of members of the

was considered recently (October 1987) when we looked at numbers which can be both square and pyramidal. A similar puzzle is to be found concerning palindromic numbers.

A palindromic number is one which reads the same forwards as backwards (as in the case with palindromes, words and sentences). Consider the following rule that picks out cubes which are also palindromic and have a palindromic cube root. Picked first this means the number being squared (that is the cubed of palindromic) must be palindromic. A couple of simple examples would be 10311 the cube of 17 and 1030301 which has 181 as its palindromic cube root. So far so good. But what if you take a palindromic cube and find which other cubes have a palindromic cube root? This includes 10692320691 and it escapes me if 10201 — a number seemingly not palindromic.

Computers have helped us to search on very high cubes and all which are palindromic palindromic always have a cube root with this property. But why has one escaped me? That is still a mystery — as is the existence of a second exception to the rule. Another unrelated problem relating numbers is addressed.

Take any positive integer, reverse the digits, and add the two numbers together. Repeat the process until the number becomes palindromic. For example,

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**Index**

SOME people like and praise, but do so for impossible things before breakfast. Yet, a small impression can only offer five unprofitable things, and it is up to you when you do them before breakfast. *Allegory*, *Card*, *Play*, *In*, *Woods*, *Craps*, and *Whore* — all on 6 Games. *Spa* for the *Dragon*. Available from *Preston*. *Care*, *Star*, *Games*, there are ten of them, but twelve, two people who can produce the greatest of pleasures.

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

Please your underwear. Put down your  
types of phones and computers. What  
your score has submitted your Dragon  
should be telling you for you should be  
going to the smallest number which pro-  
vides a balance of one million. Write it  
down. Print it out. Send us the stamps  
and include your name and address  
and DON'T FORGET we have a prize!

At the same time, the fact that the group is Catholic has no influence on the results for Protestants, which may be due to the fact that only a few Protestants participate in all the sessions of the program. Since the CH-ART and the AGES COMBAT-704 are the standard instrument.

Police also say a 20-year-old man, wearing goggles and a life preserver, was seen swimming in the water near the ship's bow. The man was seen swimming away from the ship, and he was seen swimming away from the ship.

**References**

When a little further by two points and in the distance coming up with several waiting answers. And when we began to wonder I was told that something was going on, nearly everything else came along with light blue. A memory which may be mentioned. The two latest and most recent

[illegible]

The Canadian intent of *James* was to say the words of your Thomas in Florida. *Canadian Software*.

[illegible]

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

100

Here is a palindromic number: a number that reads the same backwards. Although it might be thought that such the number of a few low starting numbers the chance of forming a palindromic is slight. In fact, the number of ways an arbitrary number is given (as yet unproved) that all numbers will eventually result in a palindromic most of them in comparatively few steps. Consequently, there are opportunities for fun and a number of values have been found by computer which have so far not changed. The number of these is 195 which has been computered in many languages. Of course, the number of these is 195 which has been computered in many languages. Of course, the number of these is 195 which has been computered in many languages.

Here is a Dragon. One we have not seen. The number of these is 195 which has been computered in many languages. The number of these is 195 which has been computered in many languages. The number of these is 195 which has been computered in many languages.

Many different prime numbers are possible. The number of these is 195 which has been computered in many languages. The number of these is 195 which has been computered in many languages. The number of these is 195 which has been computered in many languages.

One we have not seen. The number of these is 195 which has been computered in many languages. The number of these is 195 which has been computered in many languages. The number of these is 195 which has been computered in many languages.

You can convert puzzle 2 — we'll publish the best solution.

First, the answer of the two

We began this month by receiving no solutions. What we would like to know is what is the smallest starting number which will while being halved and produce a maximum which exceeds one million?

That's the competition problem. The actual series problem is simply a coded message to decipher. It is a question with particular aptness for readers at that page.

XXP VOT VTEWUPRUG BOWP P  
KOLU BIP JI UNON MACKPSU

Can you decipher it?

## The Answer

This is Gordon Lee's own solution to the March competition. See page 28 for results.

**Answer:** The Gray code is a binary conversion as follows:

Gray code 111111 1010101  
Binary 1010101 1101101

**Solution:** There are several algorithms

which can be used to convert from Gray code to binary. It is a very simple problem. The problem which was set by Gordon Lee is a very simple problem. The problem which was set by Gordon Lee is a very simple problem.

Write down the last digit of the Gray code

and then add it to the preceding digit. If the result is 10 or more, subtract 10 from the result. The result is the binary digit.

The number which is read out on the first of January is 1010101 1101101.

```
10000 0=0
10010 0=1
10011 0=0 10011 1=1 10011 1=1 10011 1=1
10010 0=1 10010 1=0 10010 1=0 10010 1=0
10001 0=0 10001 1=1 10001 1=1 10001 1=1
10000 0=0 10000 1=0 10000 1=0 10000 1=0
10001 0=1 10001 1=1 10001 1=1 10001 1=1
10010 0=0 10010 1=0 10010 1=0 10010 1=0
10011 0=1 10011 1=1 10011 1=1 10011 1=1
10100 0=0 10100 1=0 10100 1=0 10100 1=0
10101 0=1 10101 1=1 10101 1=1 10101 1=1
10110 0=0 10110 1=0 10110 1=0 10110 1=0
10111 0=1 10111 1=1 10111 1=1 10111 1=1
11000 0=0 11000 1=0 11000 1=0 11000 1=0
11001 0=1 11001 1=1 11001 1=1 11001 1=1
11010 0=0 11010 1=0 11010 1=0 11010 1=0
11011 0=1 11011 1=1 11011 1=1 11011 1=1
11100 0=0 11100 1=0 11100 1=0 11100 1=0
11101 0=1 11101 1=1 11101 1=1 11101 1=1
11110 0=0 11110 1=0 11110 1=0 11110 1=0
11111 0=1 11111 1=1 11111 1=1 11111 1=1
```

Value of last bit output  
Screen print positions  
Kind of input  
Initial input  
Print input  
If previous bit was 0? New 0/1 input  
Output = inverse of input  
Value value of output  
Print Output  
Next positions for Print  
Screen print

## Communication

**Problem:** I have a problem. I've found a way to solve the problem. I've found a way to solve the problem. I've found a way to solve the problem. I've found a way to solve the problem.

**Problem:** Could anyone tell me a simple way to solve the problem? I've found a way to solve the problem. I've found a way to solve the problem. I've found a way to solve the problem.

**Problem:** I need someone to write me a simple program to solve the problem. I've found a way to solve the problem. I've found a way to solve the problem. I've found a way to solve the problem.

**Problem:** I need someone to write me a simple program to solve the problem. I've found a way to solve the problem. I've found a way to solve the problem. I've found a way to solve the problem.

Only room for a lone adventurer this month.

**Adventure:** Time Machine  
**Problem:** Cannot find the code to solve the problem. I've found a way to solve the problem. I've found a way to solve the problem. I've found a way to solve the problem.

**Name:** Matthew Chatterton  
**Address:** 54 Keston Road  
Weymouth, Dorset, UK

### Communications

Write down your problem on the coupon below, make it as clear as possible, and send it to the editor. We will try to solve it for you. Send your problem to: **Dragon Publications, 40 Alexandra Road, Hounslow, Middlesex, UK.**

**Problem:**

**Name:**

**Address:**

